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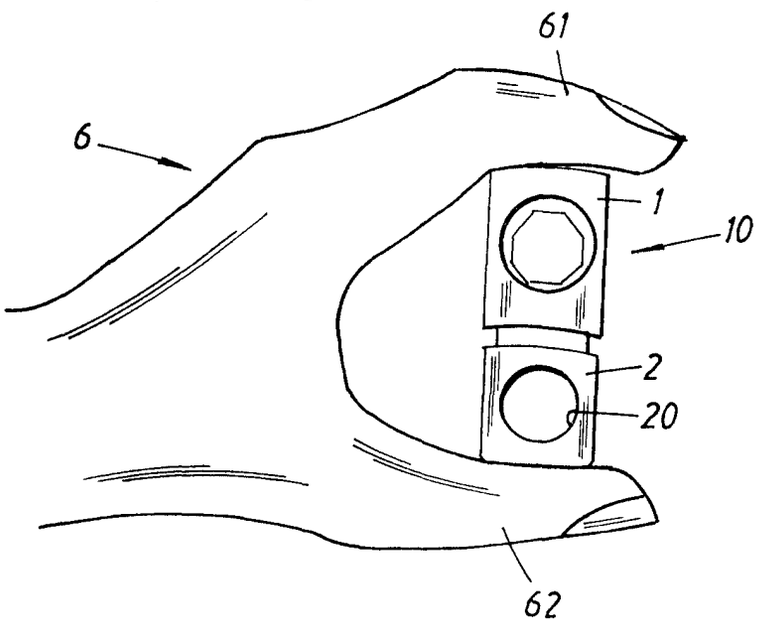
(54) A cable-stripping tool (device)

(57) A cable-stripping tool includes two parts that can be moved linearly in relation to each other, each of said parts including an opening (43, 23) which can accommodate a cable when in mutual alignment. One part (1) carries a cutting blade (3). Spring means (5) function to bias the parts (1, 2) in a direction away from each other, so as to enable the two tool parts (1, 2) to be brought together against the spring bias in mutual positions in which the cable to be stripped can be inserted into the tool.

Fig. 3



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Description

[0001] The present invention relates to a cable-stripping tool of the kind defined in the preamble of Claim 1.

[0002] Cable-stripping devices of the aforesaid kind are known from GB-A-22 15 143 and U.S. 4,640,009 for instance. Such devices/tools include two parts which are movable linearly in relation to each other and which carry respectively an abutment means and a cutting blade with an associated cable support that restricts the cutting depth of the blade. Biasing means urge the parts towards each other, so that a cable placed between the abutment means and the blade will be clamped against the blade. Tools of this kind function to establish a radial cut around the cable. The tool has a finger opening spaced from a tool guide that receives the cable, so that a user can readily twist the tool, and therewith the blade, around the cable. The known devices/tools are of a kind included by the preamble of Claim 1.

[0003] One drawback with the known tools it that they are relatively difficult to open against the spring bias, in order to allow insertion of a cable to be stripped. For instance, GB-A 22 15 143 teaches spring means that bias the linearly movable main parts of the tool towards one another. In order to open the tool, the user needs to move the tool parts apart, which is difficult to achieve even though one part of the tool can be gripped and the other part has a projection/dogging element that enables the second part to be pressed away from the first part with the thumb of the hand gripping the tool.

[0004] Accordingly, one object of the invention is to provide a tool of the aforedescribed kind that can be readily and comfortably manoeuvred with one hand when placing the cable into the tool.

[0005] A further object is to provide a tool that will enable the cutting depth of the blade to be set in a positive and comfortable fashion and, at the same time, stabilise the position of the cable or cable on the support.

[0006] These objects are achieved by means of the invention.

[0007] The invention is defined in the accompanying independent Claim 1. A particularly preferred embodiment of the invention is defined in the accompanying dependent Claim 2. Further embodiments of the invention will be apparent from the remaining dependent Claims.

[0008] According to one important feature of the invention, the tool arrangement is such that the main parts of the tool are biased in a direction away from each other by the spring element, and can be moved towards each other against the action of the spring bias, by virtue of the user squeezing the tool in the direction of relative movement of said parts with one hand, by actuation of the opposing ends of the tool in the movement direction of said parts. The tool shall have a length which enables it to be gripped comfortably in the user's hand for squeezing said parts together in the illustrated manner. The tool will also preferably include a rotatable support element which includes around its periphery supports which together with a fixed cutting blade define different blade cutting depths. The tool will also limit the possibility of movement of the cable along the support element. This is achieved by virtue of the fact that the support element has the form of a ring whose inner periphery carries the various supports. The ring-shaped support element may carry signs which indicate the cutting depth that has been established in the instant position of rotation of the ring in relation to a read-off mark on the tool-part at which the support element is rotatably mounted.

[0009] The inner periphery of the support element may have a polygonal shape around at least a part of its perimeter, wherein the sides of the polygon define supports located at different distances from the rotational axis of the support element, i.e. from the blade edge when the support elements are situated adjacent the cutting blade.

[0010] The supports which lie adjacent to a support that is in a co-operative position with the cutting blade restrict the possibility of the cable sliding along the support concerned.

[0011] The abutment may have a wedged-shape so as to prevent displacement of the cable circumferentially in relation to the abutment.

[0012] The invention will now be described in more detail by way of example and with reference to the accompanying drawings.

[0013] Fig. 1 is a schematic plan view of an inventive tool.

[0014] Fig. 2 is a schematic section view of the tool, taken in a plane which is parallel with the plan view of Fig. 1.

[0015] Fig. 3 illustrates the cable stripping opening of the tool exposed for insertion of a cable thereinto.

[0016] Fig. 4 is a schematic section view of one tool variant, wherein the section can be assumed to lie in a symmetry plane with respect to the tool.

[0017] Fig. 5 is a schematic view taken on the line 5-5 in Fig. 4.

[0018] Fig. 6 is a partial front view of one tool variant.

[0019] Fig. 7 is a schematic view taken on the line VII-VII in Fig. 4.

[0020] Figure 8 is a sectional view taken on the line VIII-VIII in Fig.7.

[0021] The tool 10 includes two main parts 1, 2 which are linearly movable in relation to one another, in a direction that stretches between the short ends of the tool. A ring 4 is rotatably mounted in one main part 1. The outer periphery 15 of the ring 4 is received in a corresponding opening 42 through the part 1. The ring 4 has an outwardly projecting peripheral flange 15 that includes markings 46 spaced peripherally around said flange and capable of being read against a read-off line 17 on the part 1. The flange 45 is exposed outwardly of the part 1, so as to enable the ring 4 to be readily rotated manually, via the flange 45.

[0022] The inner wall of the ring 4 has a polygonal configuration which is comprised of a number of supports 41 that lie at different distances from the rotational axis 27 of the ring 4. The part 1 carries a cutting blade 3 whose cutting edge is exposed in the ring cavity at its portion facing towards the part 2.

[0023] The part 2 extends into the upper portion of the part 1 through the medium of a pair of posts 21, and is connected to a crosspiece 22. The part 1 has a recess which receives the portions 21, 22 of the part 2. The upper end wall 18 of the part 1 defines an abutment surface 11 for a pair of spring elements 5, which also act on the crosspiece 22. The springs 5 include two spring legs and a winding turn located between said legs and received on an associated guide pin 16 in the part 1. The springs 5 form pressure springs that act between the end wall 18 and the crosspiece 22 for moving the parts 1, 2 away from each other. A latching clement 14, 15 prevents the parts 1, 2 from being parted by the springs 5 beyond a chosen limit position. The yoke 22 forms an angled abutment 23. The part 2 has a finger opening 20 at its exposed end, the axis of said opening being parallel with the axis of the ring 4.

[0024] Fig. 3 shows that the placement of the supports 41 around the inner perimeter of the ring 4 and the rotational mounting of the ring 4 in the part 1 enables a limited length of the tool 10 to be achieved in the relative direction of displacement of the parts 1, 2, so that the tool 10 can be comfortably gripped between the index finger 61 and the thumb 62 of one hand for squeezing of the tool 10 against the action of the springs 5, so that the abutment 23 will expose the opening of the ring 4 and therewith enable the cable to be inserted therein, whereafter the load on the tool is relieved so that the abutment 23 drives the cable 7 against the cutting blade 3, which cuts into the cable 7 to a depth defined by the support 41 located at that instance in the co-operating position relative to the blade edge 3. It will be noted that the cutting depth of the blade 3 can be set easily, by rotating the ring 4 via its exposed ring-flange 45. When the cable 7 is firmly gripped, the operator is able to insert a finger into the opening 20 of the part 2 and turn the tool 10 around the cable 7 through one revolution, whereafter the tool can be displaced axially towards the end of the cable to strip-off the cut cable casing. Alternatively, the tool can be squeezed to enable it to be removed from the cable 7.

[0025] Fig. 1 shows the tool 10 in a squeezed state, and shows that the edge of the cutting blade is exposed in the opening of the ring 4, when viewing the tool in the axial direction of the ring. The abutment 22, 23 is shown in the upper part of the ring opening for the sake of clarity. When the load on the tool is removed, the abutment 22, 23 moves towards the cutting blade 3. The cutting blade 3 may be replaceable and swapped with blades whose edges have a different angle to the axis of the ring, so as to provide other cutting-depth ranges. The cutting blade 3 is conveniently perpendicular to the direction of relative displacement of said tool parts, so that the cutting depth of the blade will be generally the same in both possible directions of rotation of the tool around the cable 7.

[0026] Alternatively, the depth of the blade 3 can be controlled or adjusted by the modification shown in Figs. 4 and 5. The modification includes a support element 148 which is guided linearly by a guide 150 in a direction towards the centre region of the ring 4. The support element 148 may have a generally cupped-shape, i.e. include a bottom and side-walls for stable reception of a cable whilst the tool I is pressed around said cable. The support 148 includes a cam follower 50 which engages a cam 48 on the ring 4. The distance of the cam 48 from the centre of the ring varies around the ring perimeter, and the cam can thus displace the support 148 to different distances from the cutting blade 3. The support 148 is shown to be biased by a spring in a radially outward direction, while the support element 148 rests on the cam 50 at the same time.

[0027] Fig. 6 shows the ring 4 fitted in the part 1, and also shows that the outer perimeter 42 of the ring supports against a shoulder 51 on the part 2 when the parts 1, 2 are combined, with the exception of one position of rotation of the ring 4 in which a recess 98 in the periphery 42 of the ring 4 receives the shoulder 51. This position of rotation may correspond to an end position for rotation of the ring 4, which is indicated in Fig. 6 by a marking X on the ring 4 lying in alignment with an indicator 77 on the part 1.

[0028] In this particular rotational position of the ring 4, the parts 1, 2 can be brought further together through a distance corresponding to the depth of the recess 98.

[0029] As will be seen from Fig. 4, the part 1 includes a through-passing channel 31 for accommodating a blade holder 30 which grips the cutting blade 3. The blade holder may have the form of a plastic body which receives the blade 3 and which forms a finger-grip 32 at one end of the channel 31. The finger-grip end 32 is shown to be flush with the outside of the part 1 when the unit 30 is fully inserted into the channel 31. Provided on the insertion end of the unit 30 is a further plastic body 34 which may be an integral part of a plastic-portion 33 that receives the bottom portion of the blade 3 and connects the parts 32, 34. The part 34 is extended by a flexible arm 35 which carries a latch hook 36 which is shown to grip over a latch strip 38. The underpart of the body 34 is shown to consist of a wedge-shaped surface that co-acts with a pin 80 connected to the part 2.

[0030] The wedge-shaped surface of the body 34 is shown to comprise two mutually sequential oblique surfaces 91, 92 of different inclinations, and the pin 80 is shown to have two corresponding oblique surfaces 81, 82. The steep surfaces 81, 91 first engage one another when the shoulder 51 engages the recess 98 (Fig. 6) and then promote strong axial displacement of the unit 30 to the left in Fig. 7, wherein the latch hook 36, which may optionally have an oblique latching surface, and the

arm 35 are able to pass free from the latch strip 38. When the less steep wedge-like surfaces 82, 92 engage one another, the unit 30 is driven out of the channel 31 and therewith allow the unit to be gripped at its grip end 32 for withdrawal and replacement. When a new unit 30 is placed in the channel 31, the arm 35 and the latch nose 36, which has a wedge-shaped surface, can be bent out to engage behind the latch strip 38. The latch nose 36 and the arm 35 are arranged, together with the latch strip 38, to hold the cutting unit 30 firmly in the channel 31.

Claims

1. A cable-stripping tool comprising two parts (1, 2) which are movable linearly towards and away from each other, a cutting blade (3) which is carried by one part (1), a support element (4, 41) which is carried by said one part (1), an abutment (22, 23) which is carried by the other part (2), spring means (5) which mutually bias said parts in their relative movement directions, whereby a cable (7) can be inserted between the abutment and the cutting blade when said parts are mutually displaced in their respective directions against the bias of said spring element, whereby the cable (7) is clamped between the abutment (22, 23) on the one hand and the cutting blade (3) on the other hand when the tool is relieved of load, wherein the distance between the cutting blade (23) and the adjacent part (41) of the support element defines the depth to which the cutting blade (3) penetrates the cable (7), wherein the tool includes a through-passing opening for receiving the cable (7), and wherein at least one of the parts (1, 2) is ring-shaped, **characterised in that** the spring element (5) is adapted to bias said parts away from each other in their directions of movement; and **in that** the length of the tool in the direction of movement of said parts is adapted to enable a user to apply a squeezing or compression force against the two mutually opposing end-parts of the tool in the direction of movement of said parts with one hand, so as to expose the cable receiving opening.

2. A tool according to Claim 1, **characterised in that** the support element (4) includes a ring-shaped support arrangement that defines said through-passing opening; and **in that** the inner wall of the support arrangement includes a plurality of supports which are spaced around the perimeter of said wall at different distances from the rotational axis of the support arrangement.

3. A tool according Claim 1 or 2, **characterised in that** each part of the central opening of the rotatable support arrangement has a distance from the rotational centre that varies around said periphery.

4. A tool according to any one of Claims 1-3, **characterised in that** the support element (4) is rotatably mounted in said one tool part (1).

5. A tool according to Claim 1, **characterised in that** the support element includes a ring-shaped support element that defines the through-passing opening; **in that** the ring-shaped support element is ring (4) which is mounted in said one part (1) for rotation about its axis; **in that** the support element includes an abutment (140) which is linearly guided generally radially in respect of the ring (4); **in that** the abutment (140) has a cam follower (50); and **in that** the ring (4) has a cam which is in engagement with the cam follower and which is spaced from the centre of the ring at a distance which varies around the periphery of the ring so as to enable a cutting depth to be set that corresponds to the rotational position of the ring relative to said one part.

6. A tool according to Claim 5, **characterised in that** the abutment (140) is carried by the radially and inwardly facing side of the cam, via the cam follower (50).

7. A tool according to Claim 6, **characterised by** a spring element adapted to bias the abutment (140) into contact with the cam (48).

8. A tool according to any one of Claims 5-7, **characterised in that** the ring (4) has an outer peripheral surface (42) which lies against a shoulder (51) on the first part (2) in the combined state of the parts (1, 2); **in that** the outer surface (42) of the ring (4) includes a recess (98) which receives the shoulder (51) in a corresponding rotational position of the ring (4) and therewith enables the parts (1, 2) to be brought together through a further distance corresponding to the depth of the recess (98); and **in that** a holder (30) carrying the cutting blade is inserted from without into a corresponding guide channel to an operating position in said tool.

9. A tool according to Claim 8, **characterised in that** the inner end of said holder includes a latch arm (35) that has a latch hook (36) which grips around a latch strip (38) for holding the holder (30) in said channel (31); and **in that** the inner end-portion (34) of the holder (30) has a wedge-like surface (91, 92) which is able to co-act with a post (80) on the first tool part (2) when said parts (1, 2) are combined and the shoulder (51) is in alignment with the recess (98) on the ring (4).

10. A tool according to Claim 9, **characterised in that** the wedge-like surface includes two parts (91, 92)

of mutually different inclinations, such that the post (80) will first co-act with the steeper surface (91) so as to apply a strong displacement force axially on the holder (30) and therewith move the holder out of the channel so as to release the holder latching mechanism (35, 36).

Fig. 1

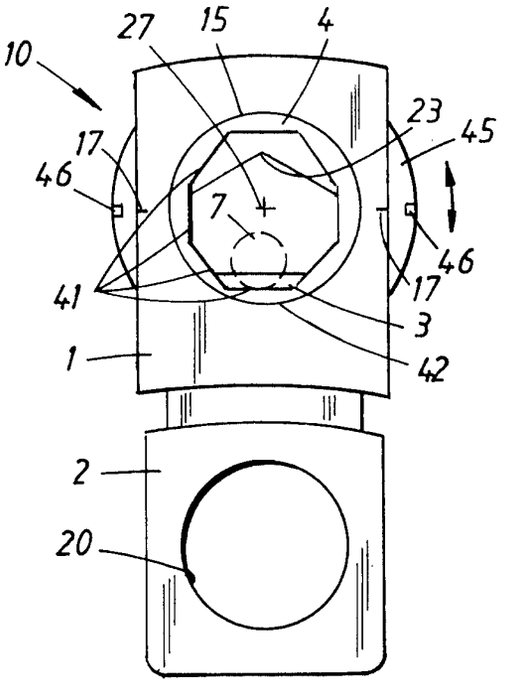

Fig. 2

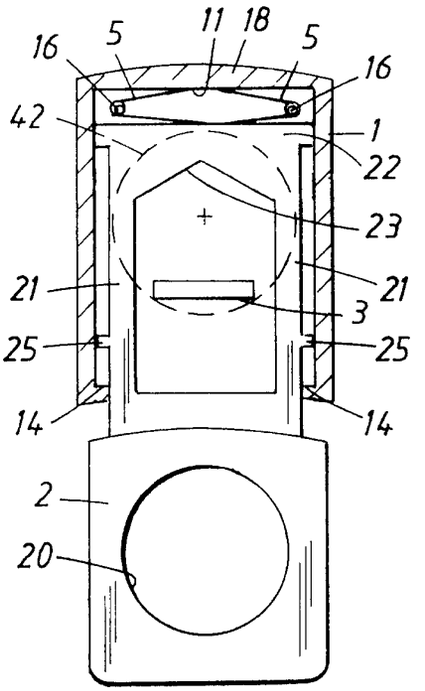

Fig. 3

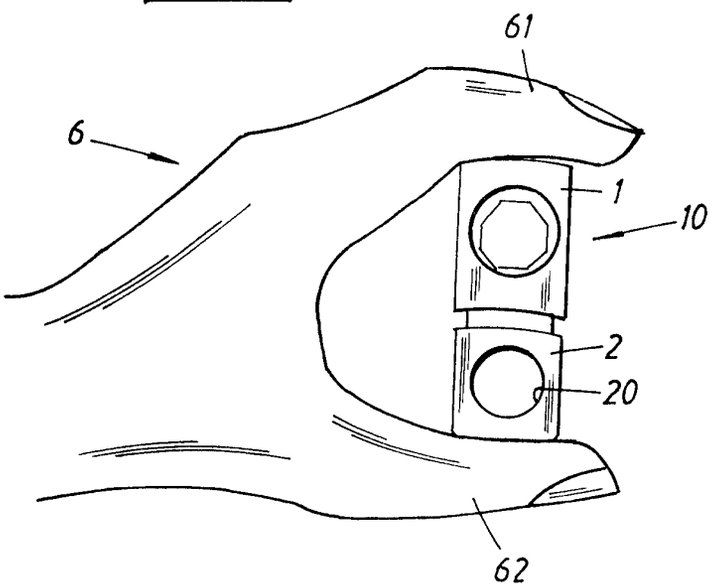

Fig.4

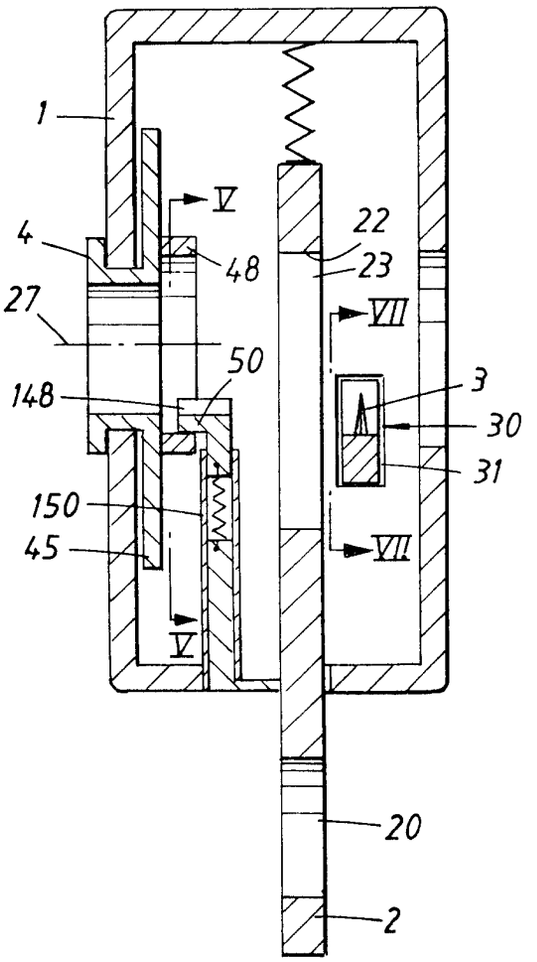

Fig.5

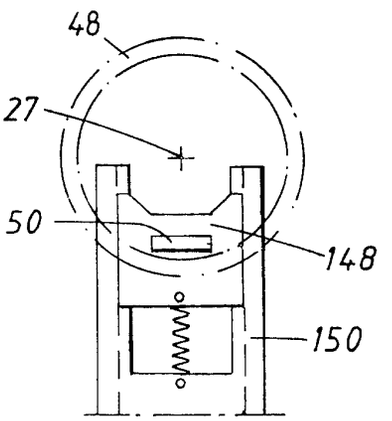

Fig. 6

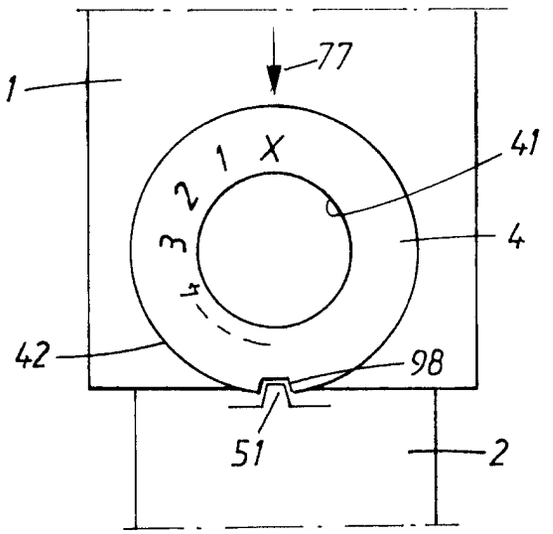

Fig. 7

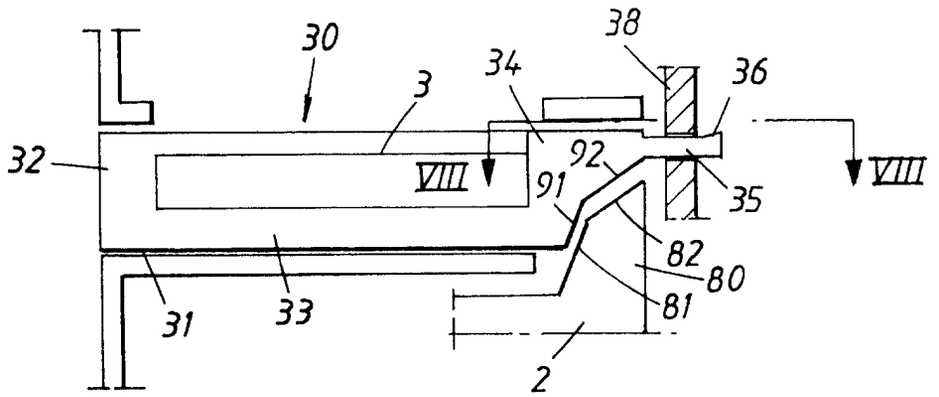

Fig. 8